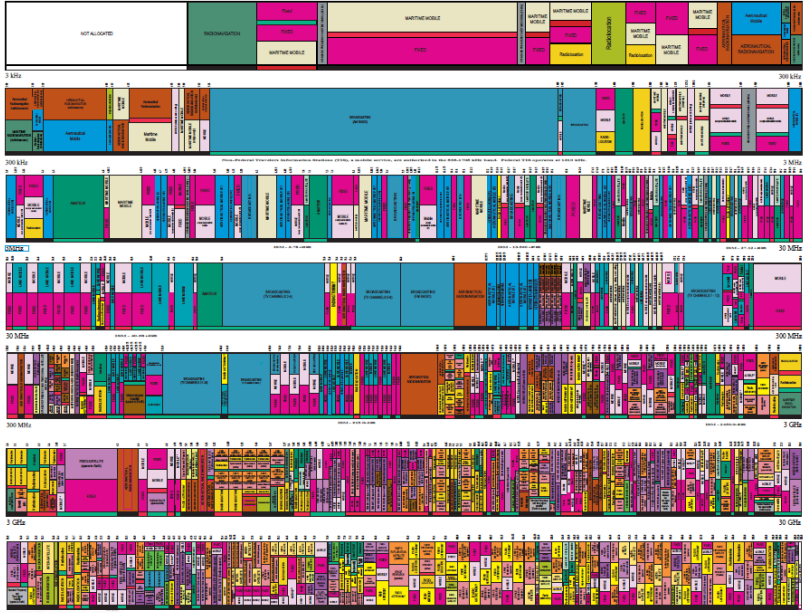
Defense Information Systems Agency
A Combat Support Agency

2011



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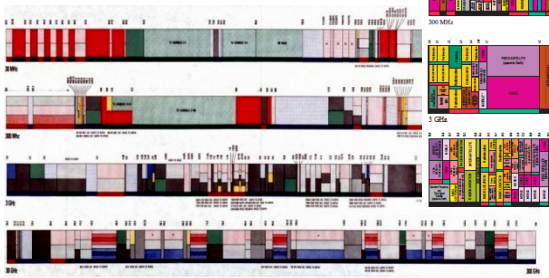

Defense Spectrum Organization Update

Defense Spectrum Organization
December 2011

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Disclaimer

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Overview

- DSO Vision and Mission
- DSO Organizational Structure
- Spectrum Challenges
- “OUR” Future

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The Knack

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Defense Spectrum Organization

Vision: Enabling information dominance through effective spectrum operations

Mission: Provide strategic electromagnetic spectrum planning, direct Combatant Command support, and enterprise capabilities and services to continuously enable effective global spectrum operations for joint warfighters, national level leaders and coalition partners

Our Goal is to be: A Center of Excellence for electromagnetic spectrum operations – embedded support, engineering/analysis, services/tools and the development of integrated spectrum plans and long-term strategies to address current and future needs for DoD spectrum access

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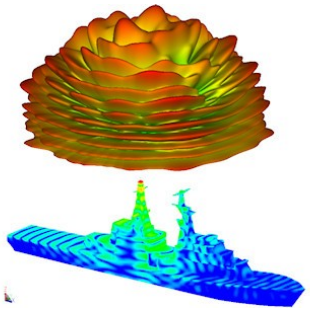
DSO provides:

- Direct Combatant Command and Joint Task Force Support
- Spectrum Advocacy - National and International electromagnetic spectrum planning
- Enterprise capabilities and services - Enables effective global spectrum operations and information dominance
- Engineering center of excellence – SME's, experience and tools required to address the complex technical and operational issues associated with spectrum operations

Embedded Support

Engineering/SME Reach Bac



United Nations

International Telecommunication Union (ITU)

Worldradiocommunication Conferences (WRCs)

US Federal Government

upporting the Warfighter

Spectrum Advocacy

Enterprise Services

DSO Organization

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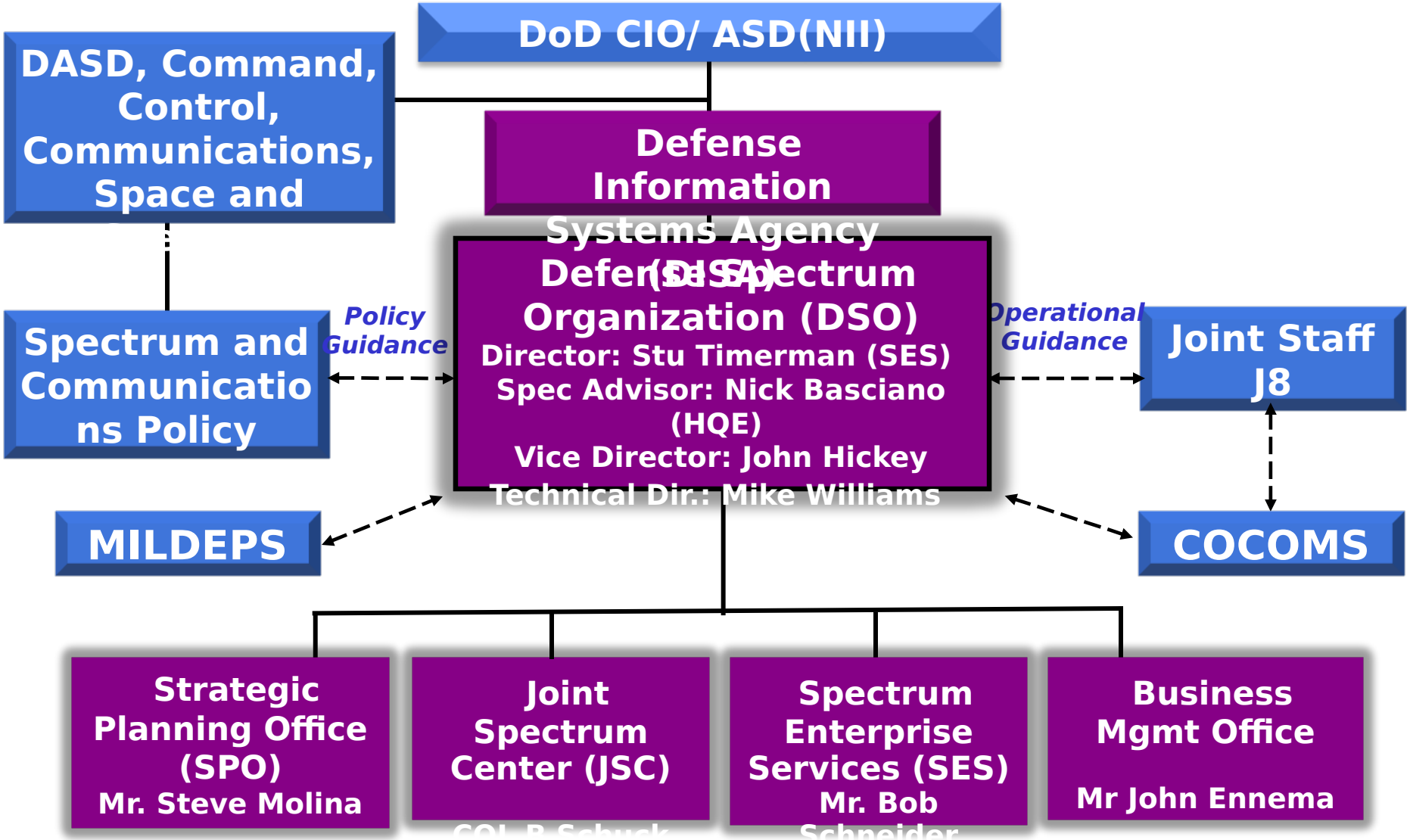

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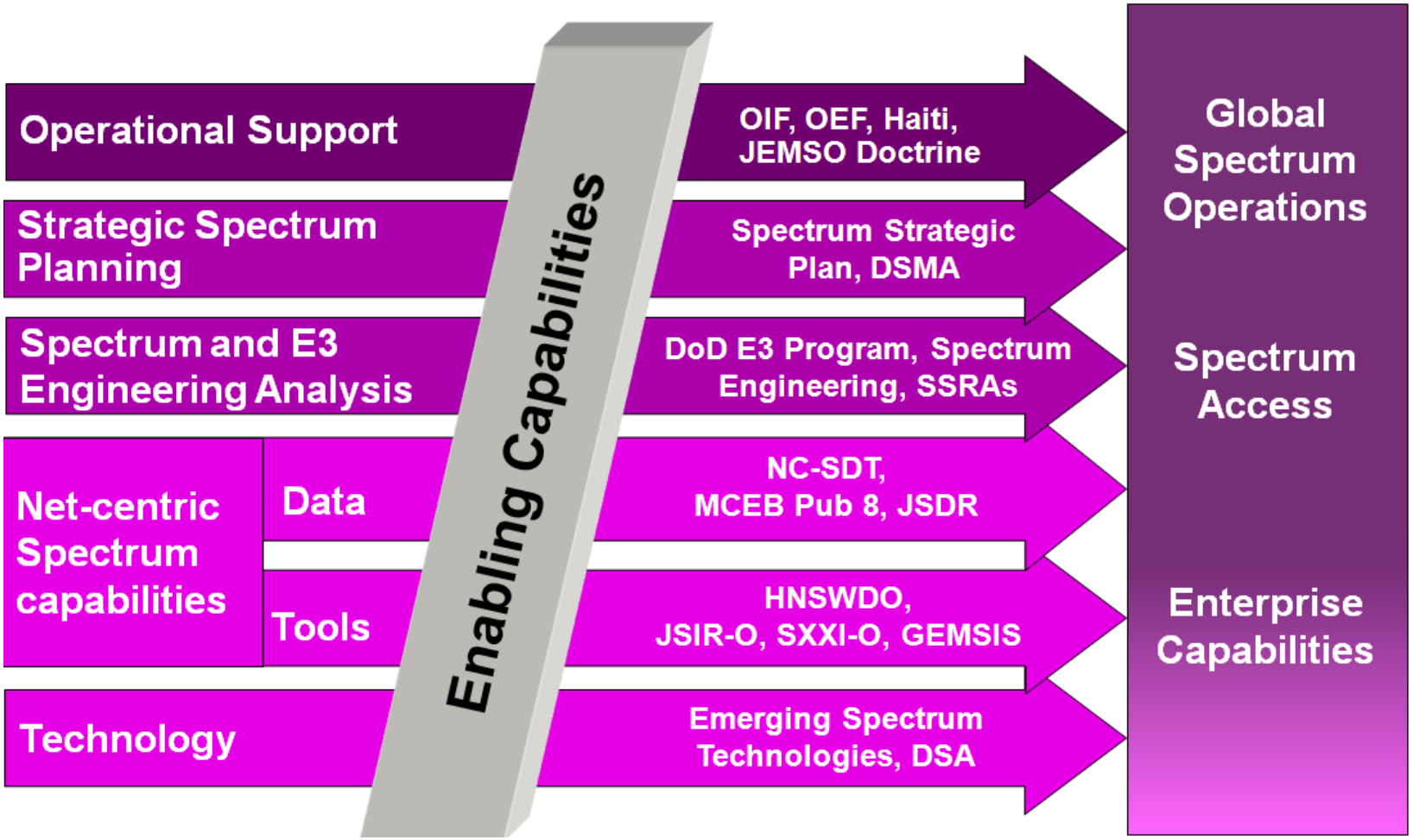
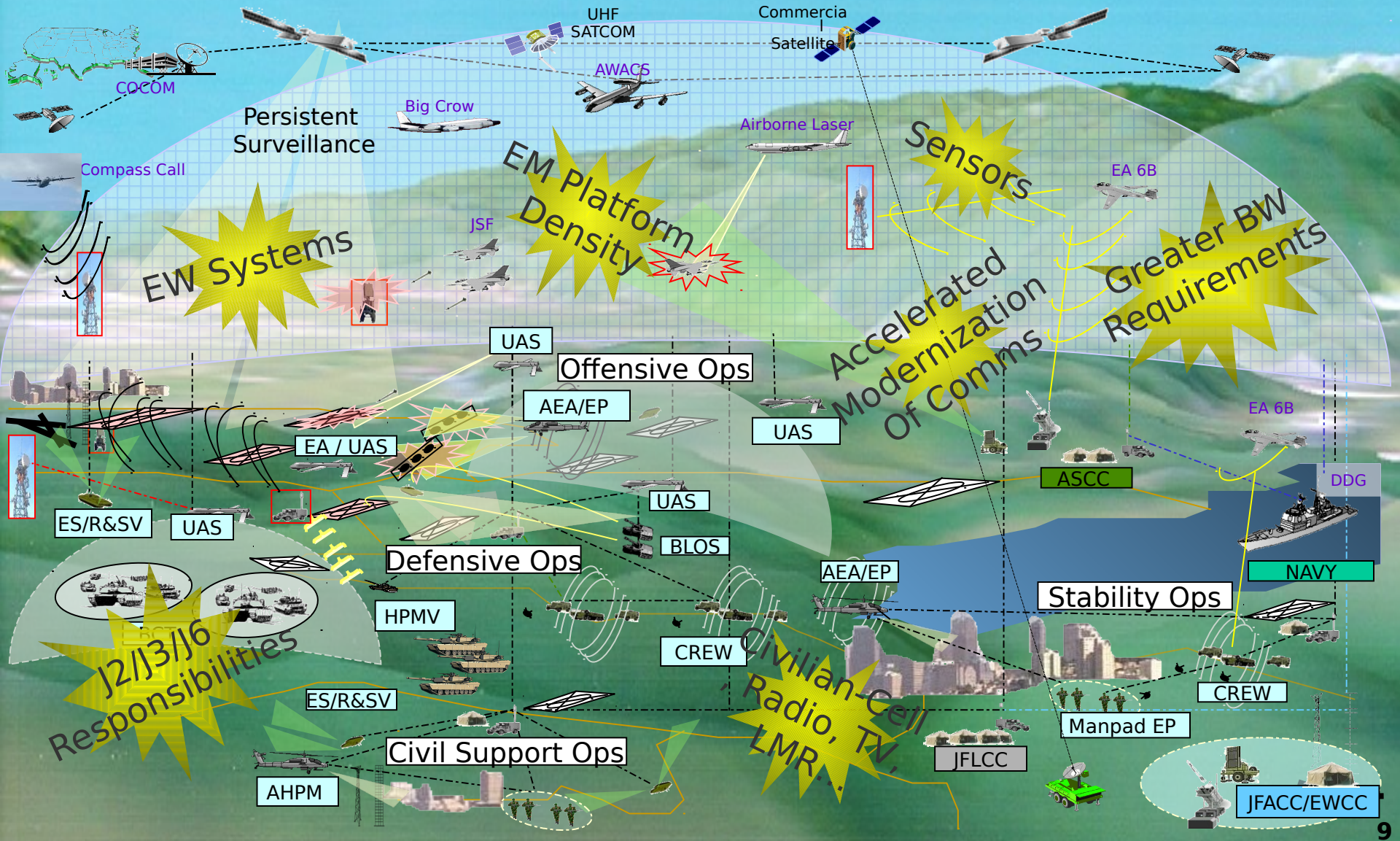
DSO Campaign Plan



DSMA – Defense Spectrum Management Architecture
DSA – Dynamic Spectrum Access
E3 – Electromagnetic Environmental Effects
GEMSIS – Global EM Spectrum Information System
HNSWDO – Host Nation Spectrum Worldwide Data On-line
JEMSO – Joint Electromagnetic Spectrum Management Operations
JSDR – Joint Spectrum Data Repository
JSIR-O – Joint Spectrum Interference Resolution On-line
NC-SDT – Net-Centric Spectrum Data Transformation
MCEB – Military Communications Electronic Board Pub 8
SSRA – Spectrum Supportability Risk Assessment
SXXI-O – Spectrum XXI Online

EM Operating Environment

Net-Centric Warfare - Higher bandwidths, Greater mobility, Greater agility, Higher tempo



DoD Spectrum Availability Trends – US

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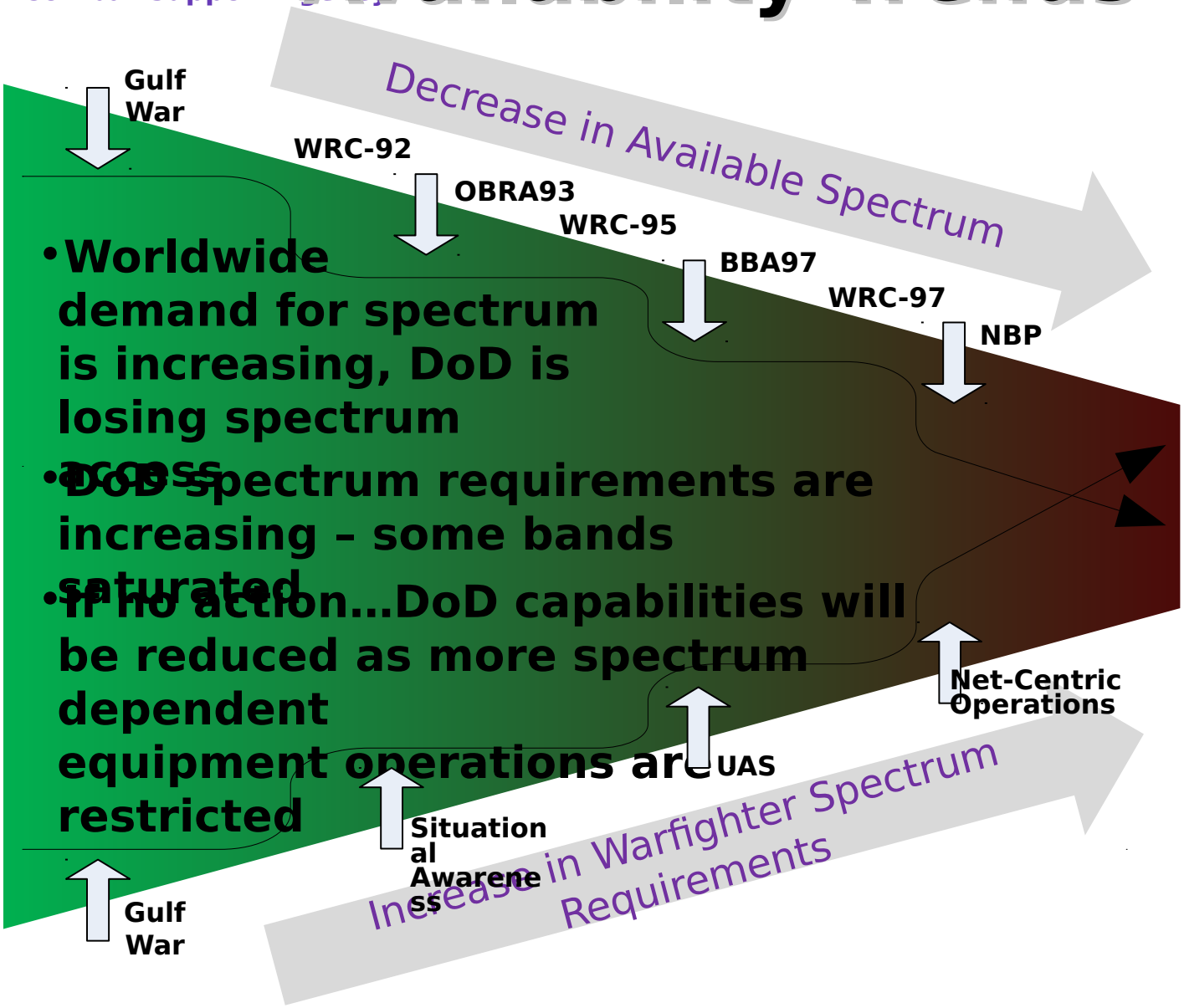

Technology may help change the shape of these curves

- Cognitive systems of systems
- Dynamic Spectrum Access (DSA)
- Multiuser Detection (MUD)
- Multiple Input Multiple Output (MIMO)
- Disruption Tolerant Networking (DTN)

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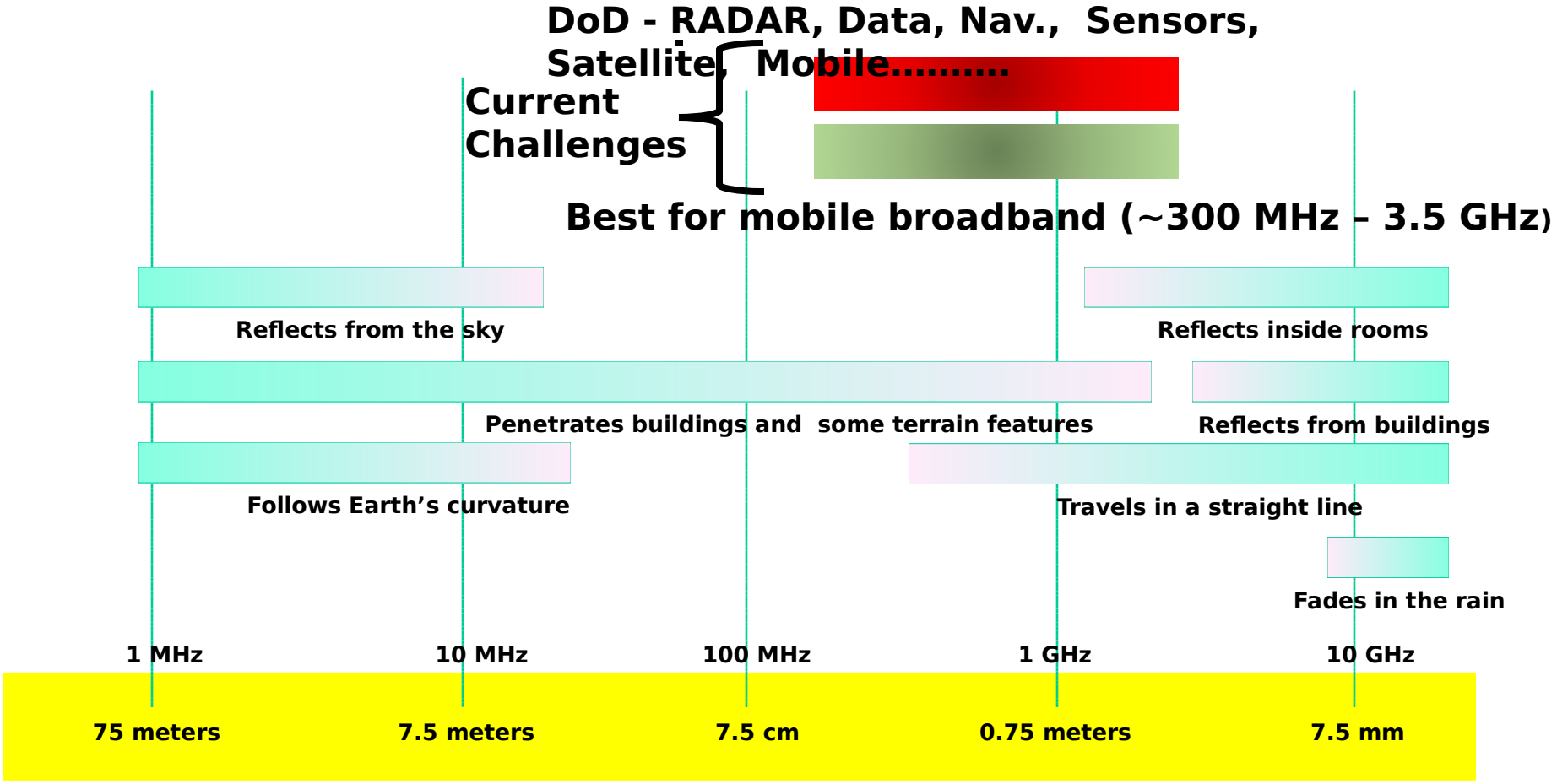
"Prime Real Estate"

Limited Spectrum for Mobile Broadband



Opportunity Window: The best frequencies for mobile broadband are high enough that the antenna can be made conveniently compact yet not so high that signals will fail to penetrate buildings. This leaves a relatively narrow range of frequencies available for use (red band)

Spectrum - Conflicting Requirements
DoD Use Below 40 GHz

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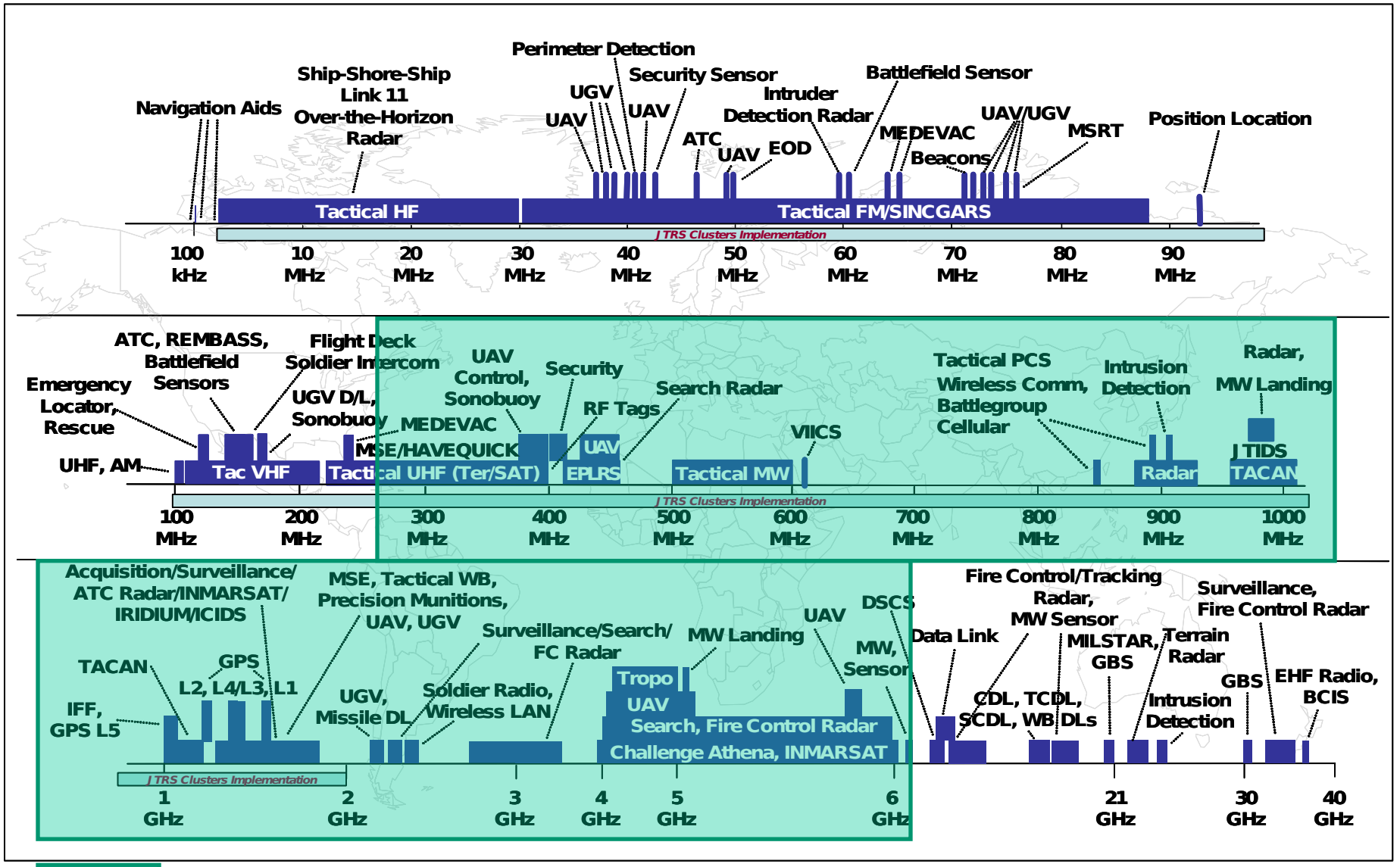

= Commercial interest

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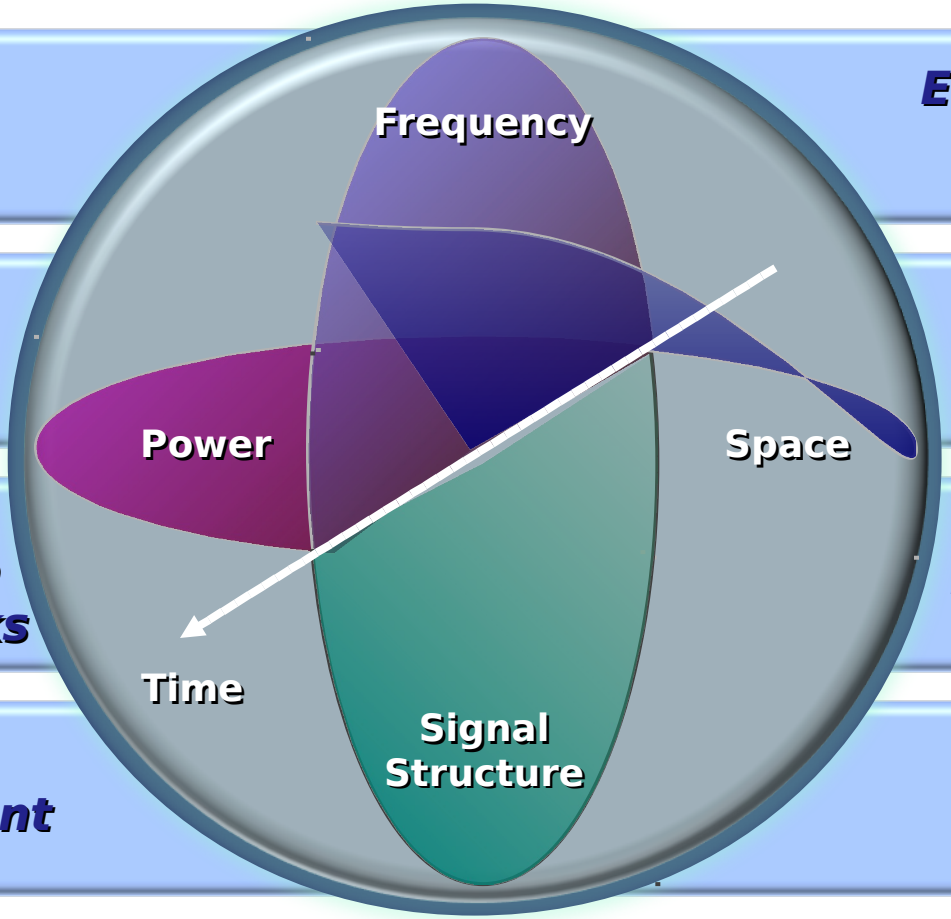
Response: Net-Centric Spectrum Management Vision

Today	Technology Enablers	Tomorrow
Growing Spectrum Usage		Effective Spectrum Usage
Long and Manual Spectrum Planning		Near Real-time & Agile Spectrum Access
Stove-pipes, Not Interoperable Radios & Networks		Sensing, Reprogrammable, Interoperable
atic equency Assignment		Adaptive Spectrum Access



Fully utilize all dimensions: frequency, time, space, signal, and power

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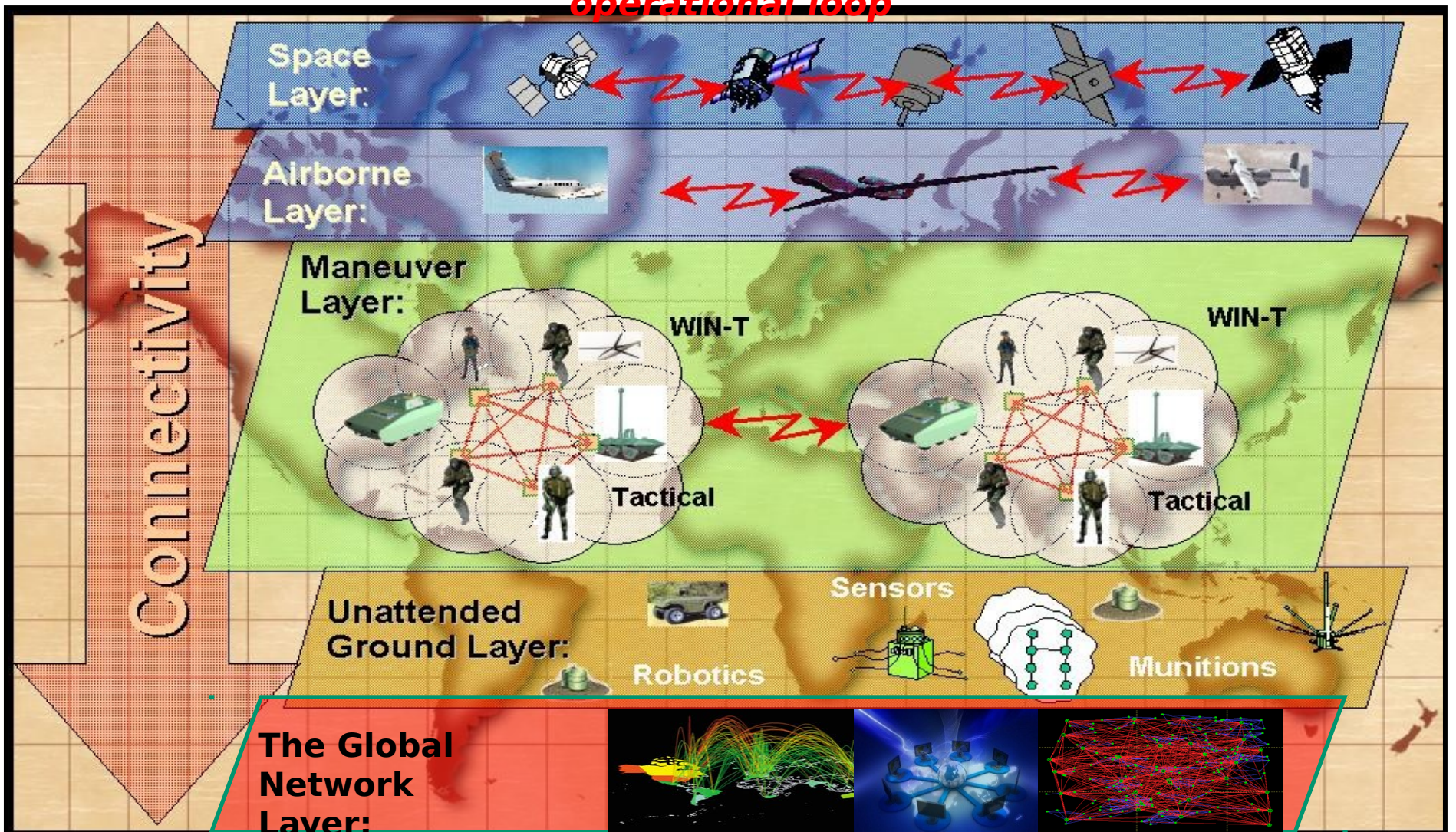
The Integrated Operational Environment Net-Centric Warfare View

Knowledge needs to be provided rapidly to get inside the enemy's operational loop



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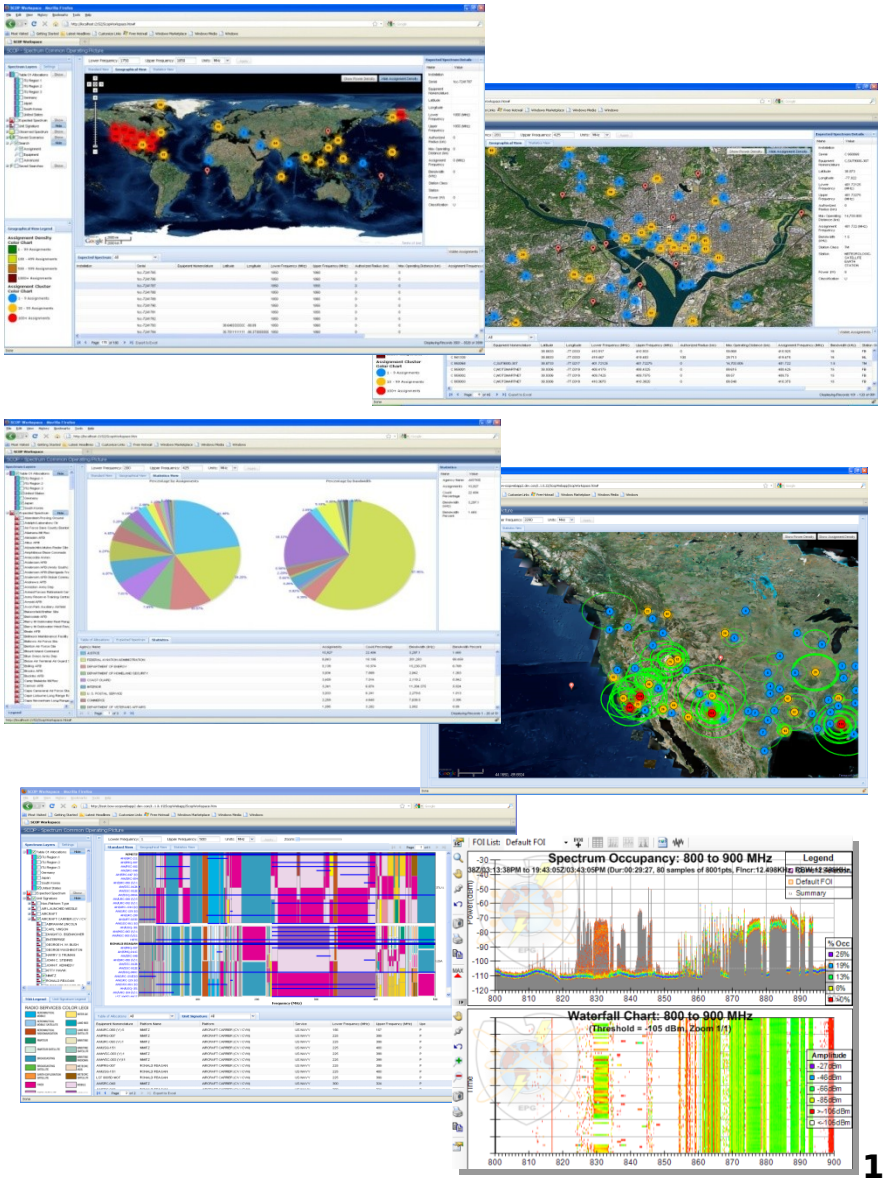
Spectrum Common Operating Picture (SCOP)

Spectrum Data Visualization

- Web application to process and layer multiple spectrum-related data sets.
  - Assignment Data
  - Unit/Platform/Equipment Characteristics Data (Tuning Ranges, etc..)
  - Dynamic/Interactive Table of Allocations
  - Expected vs. Measured Spectrum
  - Statistical Data Presentation
- Status
  - Projected IOC end of 2012



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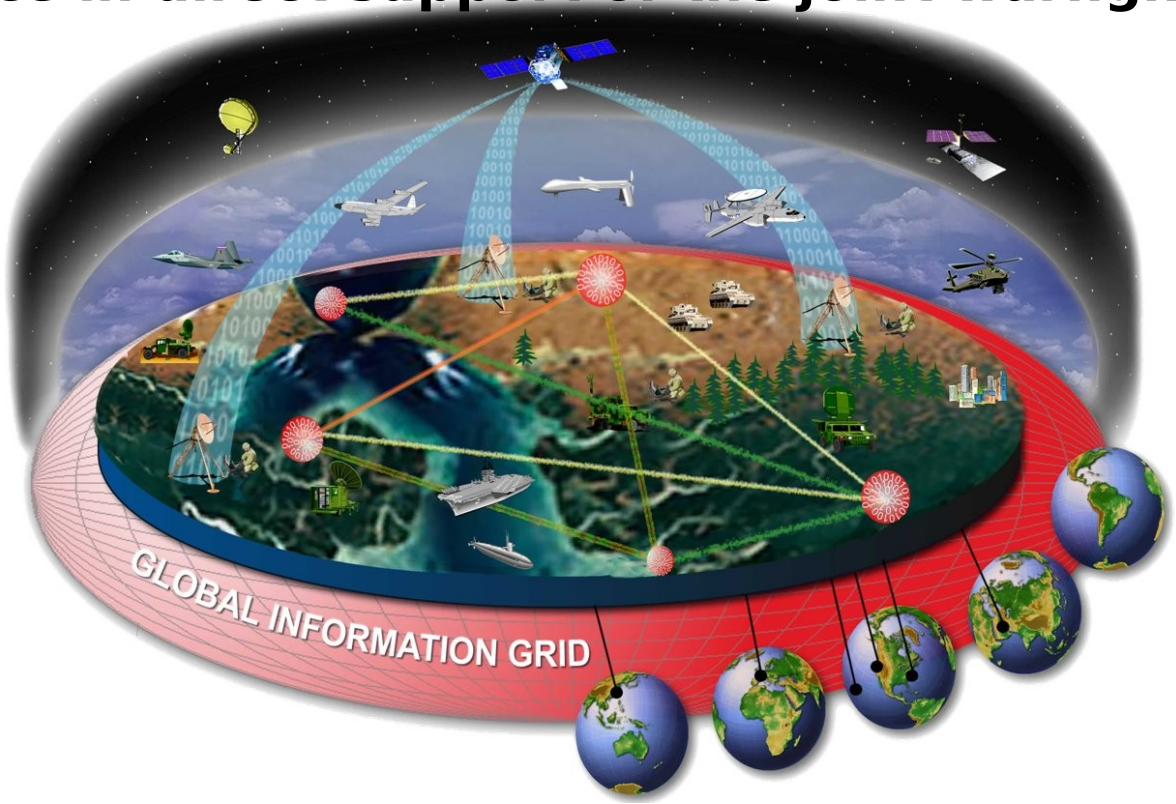
Strategic Goal
Net-centric COP

Develop a Net-centric COP to support net-centric command and control and analysis capabilities and enterprise infrastructure processes enabling information dominance in direct support of the joint warfighter



ormation Superiority - From the foxhole to the command authori

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Summary

- DoD is facing increasing complexity and mounting pressures to provide needed spectrum for operations
- DSO is responding through
  - Stepped up operational support
  - Technology and innovation
  - Engagement in national and international policy forums
  - Supporting spectrum strategy initiatives
- Development of new technologies will play a key role in future spectrum and net-centric operations – Apply proven technologies
- Developing/evaluating technologies that integrate, synchronize and choreograph across the information domain – Information Superiority

Spectrum – When and Where Needed by the Warfight

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Selected Acronym List

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Acronym	Meaning
ADM	Acquisition Decision Memorandum
AESOP	Afloat Electromagnetic Spectrum Operations Program
AoA	Analysis of Alternatives
ASD	Assistant to the Secretary of Defense
C2	Command and Control
CAE	Component Acquisition Executive
CJSMPT	Coalition Joint Spectrum Management Planning Tool
CPD	Capabilities Production Document
DIL	Disconnected Intermittent and Low Bandwidth
DISA	Defense Information System Agency
DOD	Department of Defense
DFMS	DISA Financial Management System
DSO	Defense Spectrum Organization
EMI	Electromagnetic Interference
FY	Fiscal Year
GIG	Global Information Grid
GEMSIS	Global Electromagnetic Spectrum Information System
HNSWDO	Host Nation Spectrum Worldwide Database Online
IA	Information Assurance
ICD	Initial Capabilities Document
ISD	Integrated Spectrum Desktop
JFCOM	Joint Forces Command
JROC	Joint Requirements Oversight Committee
JSC	Joint Spectrum Center
JSDR	Joint Spectrum Data Repository

Acronym	Meaning
JTRS	Joint Tactical Radio System
JTRS-XG	Joint Tactical Radio System- neXt Generation
KDP	Key Decision Point
M&S	Modeling and Simulation
MCEB	Military Communications-Electronics Board
MDD	Material Development Decision
MS	Milestone
NCES	Net-Centric Enterprise Services
NII	Networks and Information Integration
O&M	Operations and Maintenance
O&S	Operations and Sustainment
OSD	Office of the Secretary of Defense
OV	Operational View
PEO STS	Program Executive Officer SATCOM-Teleport and Services
PMO	Program Management Office
POM	Program Objective Memorandum
Pub 8	MCEB Publication 8
RACE	Rapid Access Computing Environment
RDT&E	Research, Development, Test, and Evaluation
RF	Radio Frequency
ROM	Rough Order of Magnitude
SXXIO	Spectrum XXI Online
TCS	Transformation and Communication System
TRL	Technology Readiness Level
JCEOI	Joint Communications-Electronic Operating Instruction

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DOD Bands of Interest to NTIA

Band	U.S. Allocations	Key DoD Systems	NTIA Proposal	Comments
406.1-420 MHz	**406.1-410: Shared; Mil Secondary** **410-420: Fed Exclusive**	**COTS Land Mobile Radios**	**Merge into 380-399.9 MHz**	
1300-1390 MHz	**1300-1350 :Shared ; Mil Secondary** **1350-1390:Shared ; Mil Primary** **1300-1390: Fed radio-location only Mil**	**Range Datalinks, Cobra Dane, Lightweight Counter Mortar Radar**	**Geographic Sharing**	**Risk**
1675-1710 MHz	**Shared**	**Meteorological Satellites and Radiosondes**	**Reallocate**	**Fast Track**
1755-1780 MHz	**Fed Exclusive**	**SGLS (uplink), Aeronautical Telemetry, UAVs (Pointer/Raven), JTRS (SRW/WNW), TRR (HCLOS/ DWTS), Air Combat Training Systems, Hi Res Video, PGMs, EW, Robotics, Point-to-Point Microwave**	**Initially Compression/ Exclusion Zones/ Geographic Sharing/ relocation**	**Risk**
1780-1850 MHz	**Fed Exclusive**		**In long term relocation/band reallocation**	**Risk**
2200-2290 MHz	**Fed Exclusive**	**Missile and Airborne Telemetry,** **SGLS (downlink)**	**Geographic Sharing**	
2700-2900 MHz	**Fed Exclusive**	**Air Surveillance Radars**	**Geographic Sharing**	
2900-3100 MHz	**Shared**	**AEGIS, ground penetrating and weather radars, future Navy radars**	**Geographic Sharing**	
3100-3650 MHz	**3100-3300: Shared; Mil primary** **3300-3500: Shared** **3500-3650: Mil primary**	**AEGIS, Firefinder, future Navy radars**	**Share by sensing/geographic /partial reallocation**	**Fast Track/ WiMAX**